

Attorney's Docket No. \_\_\_\_\_

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Kenneth S. Murphy

Serial No.: 10/024 518

Group No.: 1775

Filed: Dec. 21, 2001

Examiner: McNeil

For: THERMAL BARRIER COATING

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

DECLARATION OF PRIOR INVENTION IN THE UNITED STATES TO  
OVERCOME CITED PATENT OR PUBLICATION (37 CFR 1.131)

PURPOSE OF DECLARATION

1. This declaration is to establish completion of the invention in this application in the United States at a date prior to \_\_\_\_\_ April 30, 2001 \_\_\_\_\_, that is the effective date of the prior art:

- ☒ publication  
☐ patent

that was cited by the

- ☐ examiner.  
☒ applicant.

NOTE: "(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the applicant or the owner of the patent under reexamination shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the applicant or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication be more than one year prior to the date on which the applicant's or patent owner's application was filed in this country." 37 CFR 1.131(a).

NOTE: 37 CFR 1.131 is not applicable to a rejection based on a U.S. patent which CLAIMS the rejected invention.

CERTIFICATE OF MAILING/TRANSMISSION (37 CFR 1.8(a))

I hereby certify that this correspondence is, on the date shown below, being:

MAILING

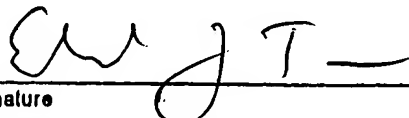
FACSIMILE

☒ deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the

☐ transmitted by facsimile to the Patent and Trademark Office

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Date: 10/22/04

  
\_\_\_\_\_  
Signature  
Edward J. Timmer  
\_\_\_\_\_  
(type or print name of person certifying)

(Declaration of Prior Invention in the United States to Overcome Cited Patent or Publication-37 CFR 1.131[9-32]—page 1 of 4)

2. The person making this declaration is (are):

- ☒ the inventor(s).
- ☐ only some of the joint inventor (and a suitable excuse is attached for failure of the omitted joint inventor(s) to sign).
- ☐ the party in interest (and a suitable explanation as why it is not possible to produce the declaration of the inventor(s) is attached).

### FACTS AND DOCUMENTARY EVIDENCE

3.

NOTE: "The affidavit or declaration must state FACTS and produce such documentary evidence and exhibits in support thereof as are available to show conception and completion of invention IN THIS COUNTRY at least the conception being at a date prior to the effective date of the reference." MPEP § 715.07.

To establish the date of completion of the invention of this application the following attached documents and/or models are submitted as evidence:

(check all applicable items below)

- ☒ copy of run sheets and log book pages recording PVD
- ☒ coating runs made using ceramic ingot (Ing.) as source of coating
- ☐ blueprints
- ☐ photographs
- ☐ reproduction(s) of notebook entries
- ☐ model
- ☐ supporting statement(s) by witness(s) (where verbal disclosures are the evidence relied upon)

NOTE: While conception is the mental part of the inventive act, it must be capable of proof, such as by demonstrative evidence or by a complete disclosure to another. Conception is more than a vague idea of how to solve a problem. The requisite means themselves and their interaction must also be comprehended. See *Mergenthaler v. Scudder* 1897 C.D. 724, 81 O.G. 1417." MPEP § 715.

From these documents and/or models it can be seen that the invention in this application was made

- ☐ on \_\_\_\_\_
- ☒ at least by the date of September 11, 2000 which is a date earlier than the effective date of the reference.

NOTE: "If the dates of the exhibits have been removed or blocked off, the matter of dates can be taken care of in the body of the oath or declaration." MPEP § 715.07.

NOTE: "The dates in the oath or declaration may be the actual dates, or, if the applicant or patent owner does not desire to disclose his or her actual dates he or she may merely allege that the acts referred to occurred prior to a specified date." MPEP § 715.07.

### DILIGENCE

NOTE: "Where there has not been reduction to practice prior to the date of the reference, the applicant or patent owner must also show diligence in the completion of his or her invention from a time just prior to the date of the reference continuously up to the date of the actual reduction to practice or up to the date of filing his or her application (filing constitutes a constructive reduction to practice, § 1.131)." MPEP § 715.07 (emphasis added).

NOTE: "A conception of an invention, though evidenced by disclosure, drawings, and even a model, is not a complete invention under the patent laws, and confers no rights on an inventor, and has no effect on a subsequently granted patent to another, UNLESS HE OR SHE FOLLOWS IT WITH REASONABLE DILIGENCE BY SOME OTHER ACT, such as an actual reduction to practice or filing an application for a patent. *Automatic Weighing Mach. Co. v. Pneumatic Scale Corp., Limited* 1909 C.D. 498, 139 O.G. 991.

"Conception in the mental part of the inventive act, but it must be capable of proof, as by drawings, complete disclosure to another person, etc. In *Mergenthaler v. Scudder*, 1897 C.D. 724, 81 O.G. 1417, it was established that conception is more than a mere vague idea of how to solve a problem; the means themselves and their interaction must be comprehended also." MPEP § 715.07.

NOTE: Only diligence before reduction to practice is a material consideration. The "lapse of time between the completion or reduction to practice of an invention and the filing of an application thereon" (*Ex parte Merz* 74 USPQ 296) is not relevant to an affidavit or declaration under 37 CFR 1.131. MPEP § 715.07(a).

Attached is a statement establishing diligence of the applicants from the time of their conception to a time just prior to the date of the reference up to the:

- ☐ actual reduction to practice.
- ☐ filing of this application.

#### TIME OF PRESENTATION OF THE DECLARATION

(complete (a), (b) or (c))

- (a) ☒ This declaration is submitted prior to final rejection.
- (b) ☐ This declaration is submitted with the first response after final rejection and is for the purpose of overcoming a new ground of rejection or requirement made in the final rejection.
- (c) ☐ This declaration is submitted after final rejection and a showing under 37 CFR 1.116(b) is submitted herewith.

#### DECLARATION

6. As a person signing below:

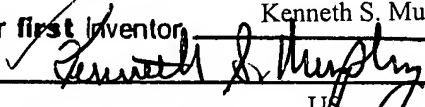
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

7.

#### SIGNATURE(S)

(complete A or B below)

##### A. Inventor(s)

Full name of sole or first inventor Kenneth S. Murphy  
Inventor's signature   
Date 10/13/04 Country of Citizenship US  
Residence Norton Shores, Michigan  
Post Office Address 3839 Applewood Lane  
Norton Shores, Michigan 49441

Ants	Run	Ing	Job	Alloy	Percent	Fixtures	Temp	Rm H	Time
7-19-00 06	2280	747	6062-02-0	Sm 54	150.4	Paddles	7	39	
7-25-00 01	2281	"	"	"	"	"	"	40	
7-25-00 02	2282	"	"	"	"	"	"	41	
7-25-00 03	2283	"	"	"	"	"	"	42	
7-25-00 04	2284	"	"	"	"	"	"	43	
7-25-00 05	2285	"	"	"	"	"	"	44	
7-25-00 06	2286	"	"	"	"	"	"	45	
7-25-00 07	2287	"	"	"	"	"	"	46	
7-25-00 01	2288	"	"	"	"	"	"	47	
7-25-00 02	2289	"	"	"	"	"	"	48	
7-25-00 01	2290	"	"	"	"	"	"	49	
7-25-00 02	2291	"	"	"	"	"	"	50	
7-25-00 03	2292	"	"	"	"	"	"	51	
7-25-00 01	2293	"	"	"	"	"	"	52	
7-25-00 02	2294	"	"	"	"	"	"	53	
7-25-00 03	2295	"	"	"	"	"	"	54	
7-25-00 01	2296	"	"	"	"	"	"	55	
7-25-00 02	2297	"	"	"	"	"	"	56	
7-25-00 03	2298	"	"	"	"	"	"	57	
7-25-00 01	2299	"	"	"	"	"	"	58	
7-25-00 02	2300	"	"	"	"	"	"	59	
7-25-00 03	2301	"	"	"	"	"	"	60	
7-25-00 01	2302	"	"	"	"	"	"	61	
7-25-00 02	2303	"	"	"	"	"	"	62	
7-25-00 03	2304	"	"	"	"	"	"	63	
7-25-00 01	2305	"	"	"	"	"	"	64	
7-25-00 02	2306	"	"	"	"	"	"	65	
7-25-00 03	2307	"	"	"	"	"	"	66	
7-25-00 01	2308	"	"	"	"	"	"	67	
7-25-00 02	2309	"	"	"	"	"	"	68	
7-25-00 03	2310	"	"	"	"	"	"	69	
7-25-00 01	2311	"	"	"	"	"	"	70	
7-25-00 02	2312	"	"	"	"	"	"	71	
7-25-00 03	2313	"	"	"	"	"	"	72	
7-25-00 01	2314	"	"	"	"	"	"	73	
7-25-00 02	2315	"	"	"	"	"	"	74	
7-25-00 03	2316	"	"	"	"	"	"	75	
7-25-00 01	2317	"	"	"	"	"	"	76	
7-25-00 02	2318	"	"	"	"	"	"	77	
7-25-00 03	2319	"	"	"	"	"	"	78	
7-25-00 01	2320	"	"	"	"	"	"	79	
7-25-00 02	2321	"	"	"	"	"	"	80	
7-25-00 03	2322	"	"	"	"	"	"	81	

RUN # 2311 DATE SUBMITTED 9/7/00 DATE COMPLETED 9-11-00 CAMPAIGN # 00 -

TYPE OF SAMPLES: Test Material 4 CHARGE #: AT0062.02.01

S/N	BOX	ALLOY	B/C	SURF. PREP	Pre-OXIDATION	Pre Thick. Wt.	Post Thick. Wt.	Increase Thick. Wt.
1. LCA2		CMSX-4	150L	-220 Grit Blast	None	13.9851	14.9454	.9603
2. 1/2" Dia. (2)		CMSX-4	None	Ultrafine Scotch Brite	None	1.0190"	1.0185"	
3. 1.5" Dia		Sapphire	None	-220 Grit Blast	None	0.405"	0.52	.0115
4. Dummy								

OBJECTIVE: Coat HRC material with 7Y40FZ using constant rotation rate. Center Position 2 on ingot centerline.

Rotation Rates:

0-65	<del>100</del> RPM
65-240	<del>100</del> RPM (175 Net)
240-330	<del>100</del> RPM (90 Net)
330-0	<del>100</del> RPM (30 Net)

Target Thickness: 11 mils

Ingot consumption: 3.5"

Ingot Feed Rate: ~~100~~

SCCM O2: ~~100~~

T/C 3: ~~100~~ F

ANALYSES: Thickness Weight Change

Ingot Consumption Target	
Start	<u>4.99</u>
Target	<u>3.50</u>
Ingot Finish	<u>1.49</u>

PREHEAT

Preheat T/C #5: \_\_\_\_\_  
Rake T/C#3: \_\_\_\_\_  
Ramp Time: \_\_\_\_\_  
Soak Time: \_\_\_\_\_  
Pressure: \_\_\_\_\_  
Atmosphere: \_\_\_\_\_  
RGA: \_\_\_\_\_

PVD PARAMETERS

REMARKS

Monitor ( )  
min.  
min.  
High Vac  
High Vac  
H<sub>2</sub>O < 5 X 10<sup>-7</sup> torr prior to preheater power draw

COATING

Ceramic Ingot Lot #: 746Hz  
Ingot Idle Power: kW maintenance scan  
Evaporation Power: kW 5 min before insertion  
Doghouse T/C #4: Monitor  
Rake T/C #3: \_\_\_\_\_  
Coating Gas Flow: \_\_\_\_\_ sccm  
Coating Atmosphere: Oxygen  
Oxygen Start: \_\_\_\_\_  
Ingot -to-Part Distance: \_\_\_\_\_ inch  
EB Scan: T1  
RGA: H<sub>2</sub>O < 8 X 10<sup>-7</sup> torr 1st production run of campaign  
H<sub>2</sub>O < 3 X 10<sup>-7</sup> torr remainder of campaign

MOTION

Program: "3pcoupon.pmc"  
Rotation Rates: 0-65 RPM (0 = Coupons down)  
65-240 RPM (175 Net)  
240-330 RPM (90 Net)  
330-0 RPM (30 Net)

Load Lock Sting Pos.: 0  
Preheat Sting Pos.: 42.1375"  
Coating Sting Pos.: 93.5375"

# PVD1 RUN SHEET: HRC 7Y 4KZ Specific Heat and Diffusivity

RUN # 2312 DATE SUBMITTED 9/7/02 DATE COMPLETED 9-11-02 CAMPAIGN # 00 -

TYPE OF SAMPLES: Test Material 4 CHARGE #: AT0062.02.01

S/N	BOX	ALLOY	B/C	SURF. PREP	Pre-OXIDATION	Pre Thick. Wt.	Post Thick. Wt.	Increase Thick. Wt.
1. <u>1.631</u>		CMSX-4	150L	-220 Grit Blast	None	13.9628	15.2868	1.324
2. <u>1/2" Dia. (2)</u>		CMSX-4	None	Ultrafine Scotch Brite	None	0.18"	0.35"	.0135"
3. <u>4.5" Dia</u>		Sapphire	None	-220 Grit Blast	None	0.39"	0.53	.014
4. Dummy								

OBJECTIVE: Coat HRC material with 7Y4KZ using constant rotation rate. Center Position 2 on ingot centerline.

Rotation Rates: 4-6 u 0-65 11 RPM  
 65-240 11 RPM (175 Net)  
 240-330 11 RPM (90 Net)  
 330-0 11 RPM (30 Net)

Target Thickness: 11 mils

Ingot consumption: 3.5

Ingot Feed Rate: 11

SCCM O2: 11

T/C 3: 11 F

ANALYSES: Thickness  
Weight Change

Ingot Consumption Target	
Start	<u>5.35</u>
Target	<u>3.50</u>
Ingot Finish	<u>1.85</u>

## PREHEAT

Preheat T/C #5:

Rake T/C#3:

Ramp Time:

Soak Time:

Pressure:

Atmosphere:

RGA:

Monitor ( )

min.

min.

High Vac

High Vac

$H_2O < 5 \times 10^{-7}$  torr prior to preheater power draw

REMARKS

## PVD PARAMETERS

## COATING

Ceramic Ingot Lot #:

Ingot Idle Power:

Evaporation Power:

Doghhouse T/C #4:

Rake T/C #3:

Coating Gas Fow

Coating Atmosphere:

Oxygen Start:

Ingot -to-Part Distance:

EB Scan:

RGA:

7Y46H2

kW maintenance scan

kW 5 min before insertion

Monitor

scm

Oxygen

inch

T1

$H_2O < 8 \times 10^{-7}$  torr 1st production run of campaign

$H_2O < 3 \times 10^{-7}$  torr remainder of campaign

## MOTION

Program:

Rotation Rates:

"3pcoupon.pmc"

0-65 RPM (0 = Coupons down)

65-240 RPM (175 Net)

240-330 RPM (90 Net)

330-0 RPM (30 Net)

Load Lock Sting Pos.: 0

Preheat Sting Pos.: 42.1375"

Coating Sting Pos.: 93.5375"



# PVD1 RUN SHEET: HRC 2( 20Y40HZ Specific Heat and Diffusivity

RUN # 2313 DATE SUBMITTED 9/7/00 DATE COMPLETED 9-12-00-01 CAMPAIGN # 00 -

TYPE OF SAMPLES: Test Material 4 CHARGE #: AT0062.02.01

S/N	BOX	ALLOY	B/C	SURF. PREP	Pre-OXIDATION	Pre Thick. Wt.	Post Thick. Wt.	Increase Thick. Wt.
1. LC59		CMSX-4	150L	-220 Grit Blast	None	14.0783 .1275"	15.4302 .144	.0165
2. 1/2" Dia. (2)		CMSX-4	None	Ultrafine Scotch Brite	None	.0175"	.043"	.0255"
3. 1.5" Dia		Sapphire	None	-220 Grit Blast	None	.4852 .04"	.7971 .058	.3119 .018
4. Dummy "D1.4						4.6262 .0185"	5.8 .042"	.1738 .0235"
						.5068	.8467	.3399

OBJECTIVE: Coat HRC material with 20Y40HZ using constant rotation rate. Center Position 2 on ingot centerline.

Rotation Rates:

0-65	RPM
65-240	RPM (175 Net)
240-330	RPM (90 Net)
330-0	RPM (30 Net)

Target Thickness: 11 mils

Ingot consumption: 3.5"

Ingot Feed Rate:

SCCM O2:

T/C 3:

ANALYSES:

Thickness  
Weight Change

BEST AVAILABLE COPY

Ingot Consumption Target	
Start	<u>4.44</u>
Target	<u>3.5</u>
Ingot Finish	<u>.94</u>

## PREHEAT

Preheat T/C #5:  
 Bake T/C#3:  
 Ramp Time:  
 Soak Time:  
 Pressure:  
 Atmosphere:  
 RGA:

## PVD PARAMETERS

REMARKS


## COATING

Ceramic Ingot Lot #:  
 Ingot Idle Power:  
 Evaporation Power:  
 Doghouse T/C #4:  
 Bake T/C #3:  
 Coating Gas Flow  
 Coating Atmosphere:  
 Oxygen Start:  
 Ingot -to-Part Distance:  
 EB Scan:  
 RGA:

20Y40H2r  
 kW maintenance scan  
 kW 5 min before insertion  
 F Monitor  
 F  
 sccm  
 Oxygen  
 inch  
 T1  
 H<sub>2</sub>O < 8 X 10<sup>-7</sup> torr 1st production run of campaign  
 H<sub>2</sub>O < 3 X 10<sup>-7</sup> torr remainder of campaign

## MOTION

Program:  
 Rotation Rates:

"3pcoupon.pmc"  
 0-65 RPM (0 = Coupons down)  
 65-240 RPM (175 Net)  
 240-330 RPM (90 Net)  
 330-0 RPM (30 Net)

Load Lock Sting Pos.:  
 Preheat Sting Pos.:  
 Coating Sting Pos.:

0  
 42.1375"  
 93.5375"